1. An external fluid flow regulator incorporated into the surface of an object for regulating pressure gradients and influencing fluid flow across said surface, said external fluid flow regulator comprising:

a leading edge comprising a surface capable of receiving a fluid thereon;

an orthogonal pressure recovery drop that extends a pre-determined distance away from said leading edge and said fluid and its flow, wherein said pressure recovery drop comprises at least one drop face therein, said at least one drop face having a pre-determined height, said pressure recovery drop functions to regulate existing pressure gradients along said surface to optimize and equalize said fluid flow, wherein said regulation of said pressure gradients positively influences the flow properties and behavior of said fluid across said surface of said object, and the performance of said object subject to said fluid flow;

a sub-atmospheric barrier that is suddenly generated as said fluid encounters and flows over said pressure recovery drop, said sub-atmospheric barrier comprising a low pressure area of fluid molecules having decreased kinetic energy that serve as a cushion between said higher kinetic energy fluid molecules in said fluid and the molecules at said surface to facilitate laminar flow and assist in the reduction of the separation potential of said fluid; and

a trailing edge that defines and extends from the base of said pressure recovery drop that provides a trailing flow boundary for said fluid.

2. The external fluid flow regulator of claim 1, wherein said pressure recovery drop is oriented in a position selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

3. The external fluid flow regulator of claim 1, wherein said pressure recovery drop comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

4. The external fluid flow regulator of claim 1, wherein said fluid flow regulator comprises a pressure gradient regulator.

5. The external fluid flow regulator of claim 1, wherein said pressure recovery drop extends entirely across said surface.

6. The external fluid flow regulator of claim 1, wherein said pressure recovery drop extends across only a portion of said surface.

7. The external fluid flow regulator of claim 1, wherein said surface comprises a plurality of fluid flow regulators that function together to regulate, influence, and control fluid flow and its properties and characteristics across said surface.

8. The external fluid flow regulator of claim 1, wherein said fluid flow regulator is a dynamic fluid flow regulator capable of adjusting, on demand, with varying design constraints, flow characteristics, environmental conditions, and operational situations pertaining to said fluid, said object, and any combination of these during

9. The external fluid flow regulator of claim 8, wherein said dynamic fluid flow regulator comprises at least one selectively adjustable component, wherein said adjustable components are selected from a movable leading edge, a movable pressure recovery drop, and a movable trailing edge, each capable of adjusting the height of said drop face and said pressure drop.

10. The external fluid flow regulator of claim 1, wherein said fluid flow regulator comprises means for effectuating vector positioning about said surface.

11. The external fluid flow regulator of claim 1, wherein said fluid flow regulator comprises at least one component that oscillates with varying situations and conditions to vary the height of said pressure recovery drop.

12. The external fluid flow regulator of claim 1, wherein said leading edge is integrally formed with said surface.

13. The external fluid flow regulator of claim 1, wherein said pressure recovery drop is integrally formed with said surface.

14. The external fluid flow regulator of claim 1, wherein said trailing edge is integrally formed with said surface.

15. The external fluid flow regulator of claim 1, wherein said leading edge, said pressure recovery drop, and said trailing edge of said fluid flow regulator are each embodied in a fluid flow regulator device that is removably attachable to an existing surface to allow said existing surface to comprise one or more fluid flow regulators.

16. The external fluid flow regulator of claim 1, wherein said pressure recovery drop comprises a plurality of drop faces to magnify the influence of fluid flow regulator on said fluid.

17. The external fluid flow regulator of claim 16, wherein said plurality of drop faces each comprise a sub-atmospheric barrier.

18. The external fluid flow regulator of claim 1, wherein said .

19. The external fluid flow regulator of claim 1, wherein said pressure recovery drop is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure about said object, which adverse

pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

20. The external fluid flow regulator of claim 1, wherein said fluid is selected from the group consisting of gaseous fluids, liquid fluids, and any combination of these.

21 An object surface having improved fluid flow thereon, said object surface comprising:

at least one fluid flow regulator comprising a pressure recovery drop having at least one drop face formed therein, said fluid flow regulator functioning to optimize fluid flow over said surface of said object.

22. The object surface of claim 21, wherein said fluid flow regulator is integrally formed with said surface.

23. The object surface of claim 21, wherein said fluid flow regulator is removably attached to said surface.

24. The object surface of claim 21, wherein said fluid flow regulator is positioned in an orientation selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

25. The object surface of claim 21, wherein said fluid flow regulator comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

26. The object surface of claim 21, wherein said fluid flow regulator is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure about said object, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

27. The object surface of claim 21, wherein said fluid flow regulator comprises a dynamic fluid flow regulator capable of varying the height of said at least one drop face consistently along the length of said pressure recovery drop, as well as inconsistently along the length of said pressure recovery drop.

28. The object surface of claim 21, wherein said fluid flow regulator comprises means for effectuating vector positioning about said object surface.

29. The object surface of claim 21, wherein said fluid is selected from the group consisting of gaseous fluids, liquid fluids, and any combination of these.

30. The object surface of claim 21, wherein said pressure recovery drop comprises an orthogonal design.

31. A fluid flow control system comprising:

an object having at least one surface subjected to a fluid, such that said fluid flows about said object;

a fluid flow regulator featured and operable with said surface, said fluid flow regulator comprising:

a leading edge;

a pressure recovery drop that extends a pre-determined distance away from said leading edge and has at least one drop face formed therein, said pressure recovery drop functions to regulate existing pressure gradients along said surface to optimize and equalize said fluid flow;

a sub-atmospheric barrier that is suddenly generated as said fluid encounters and flows over said pressure recovery drop, said sub-atmospheric barrier comprising a low pressure area of fluid molecules having decreased kinetic energy that serve as a cushion between said higher kinetic energy fluid molecules in said fluid and the molecules at said surface; and

a trailing edge that defines and extends from the base of said pressure recovery drop, said fluid flow regulator functioning to optimize fluid flow over said surface of said object.

32. A method for influencing external fluid flow over the surface of an object by regulating pressure gradients, and for reducing fluid separation about said surface, said method comprising the steps of:

featuring at least one fluid flow regulator with one or more surfaces of an object having at least one surface thereon, said fluid flow regulator comprising:

a pressure recovery drop having at least one drop face formed between a leading and trailing edge and having an identified and calculated distance;

subjecting said object to a fluid, such that said fluid is caused to move about said object; and

causing said fluid to encounter said fluid flow regulator, such that said pressure recovery drop induces a sudden drop in pressure as said fluid flows over said fluid flow regulator, wherein a sub-atmospheric barrier is created at the base of said drop face, said fluid flow regulator functioning to optimize fluid flow about said object, thus increasing the performance of said object in said fluid.

33. The method of claim 32, wherein said step of featuring comprises the step of positioning said fluid flow regulator at an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure about said object, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

34. The method of claim 33, wherein said step of positioning said fluid flow regulator comprises positioning it in an orientation selected from the group consisting of perpendicular to the direction of flow of said fluid, substantially perpendicular to the direction of flow of said fluid, on an angle with respect to said direction of flow of said fluid, parallel or substantially parallel to the direction of flow of said fluid, and any combination of these.

35. The method of claim 33, further comprising the step of repositioning said fluid flow regulator as said optimal pressure recovery points change in response to varying conditions surrounding said fluid flow.

36. The method of claim 32, further comprising the step of varying said pressure recovery drop, and particularly said height of said drop face, both consistently and inconsistently, along the length of said pressure recovery drop in response to changing conditions.

37. The method of claim 32, wherein said step of causing said fluid to encounter said fluid flow regulator has the effect of optimizing fluid flow and the performance of said object within said fluid, said fluid flow regulator:

regulating the pressure gradients that exist along said surface by reducing the pressure drag at various locations along said surface, as well as the

pressure drag induced forward and aft of said object, via a pressure recovery drop;

increasing pressure recovery and pressure recovery potential as a result of regulating said pressure gradients and reducing said pressure drag;

reducing friction drag along said surface as a result of increasing said pressure recovery; and

decreasing fluid separation and fluid separation potential as a result of said reducing friction drag.

38. A method for controlling the flow of fluid across an object surface and reducing fluid separation, said method comprising the steps of:

obtaining an object subject to fluid flow, said object having one or more fluid bearing surfaces over which a fluid may flow;

featuring one or more fluid flow regulators in said fluid bearing surfaces, said fluid flow regulator regulating pressure gradients and optimizing fluid flow and the performance of said object in said fluid;

subjecting said object to said fluid; and

causing said fluid to flow about said object so that said fluid encounters said one or more fluid flow regulators.

39. The method of claim 38, wherein said one or more fluid flow regulators comprise:

a leading edge existing in a plane and comprising a surface area, said fluid initially flowing across at least a portion of said leading edge;

a trailing edge also comprising a surface area, said trailing edge existing in a plane offset in a substantially parallel relationship from said plane of said leading edge, said trailing edge extending outward from said leading edge in the direction of flow of said fluid; and

a pressure recovery drop relating said leading edge to said trailing edge, said pressure recovery drop comprising a drop face of a determined height extending between said leading edge and said trailing edge in a substantially perpendicular manner, said fluid flowing over said leading edge then said pressure recovery drop, which induces

a sudden pressure drop that generates a sub-atmospheric barrier at the base of said drop face.

40. The method of claim 39, wherein said leading edge is adjustable to allow said height of said drop face to be adjusted as needed, both consistently and inconsistently.

41. The method of claim 39, wherein said trailing edge is adjustable to allow said height of said drop face to be adjusted as needed, both consistently and inconsistently.

42. The method of claim 39, further comprising an adjusting plane that extends from a rotatable attachment point distal said drop face to said drop face of said pressure recovery drop, said adjusting plane allowing said height of said drop face to be adjusted on demand in response to changing conditions.

43. A wing structure comprising:

a frontal surface;

an upper surface relating with said frontal surface;

a lower surface opposite said upper surface and relating with said frontal surface;

a wing tip relating to said upper and lower surfaces; and

at least one fluid flow regulator featured and operable with said upper surface, said fluid flow regulator comprising a leading edge, a trailing edge, and a pressure recovery drop extending between said upper and lower surfaces to form a down step, said pressure recovery drop comprising at least one drop face of a calculated height formed therein, said fluid flow regulator functioning to optimize air flow over said surface of said wing during flight of an aircraft and during various angles of attack.

44. The wing structure of claim 43, further comprising a fluid flow regulator featured and operable with said lower surface.

45. The wing structure of claim 43, wherein said fluid flow regulator is integrally formed with said surface.

46. The wing structure of claim 43, wherein said fluid flow regulator is removably attached to said surface.

47. The wing structure of claim 43, wherein said fluid flow regulator is positioned in an orientation selected from the group consisting of perpendicular to the direction of flow of said air, substantially perpendicular to the direction of flow of said air, on an angle with respect to said direction of flow of said air, parallel or substantially parallel to the direction of flow of said air, and any combination of these.

48. The wing structure of claim 43, wherein said fluid flow regulator comprises a formation selected from the group consisting of linear, curved, spline, and any combination of these.

49. The wing structure of claim 43, wherein said fluid flow regulator is positioned at or proximate an optimal pressure recovery point as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure about said wing structure, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.

50. The wing structure of claim 43, wherein said fluid flow regulator comprises a dynamic fluid flow regulator capable of varying the height of said at least one drop face consistently along the length of said pressure recovery drop, as well as inconsistently along the length of said pressure recovery drop.

51. The wing structure of claim 43, wherein said fluid flow regulator comprises means for effectuating vector positioning about said wing.

52. The wing structure of claim 43, wherein said pressure recovery drop comprises an orthogonal design.

53. The wing structure of claim 43, wherein said upper and lower surfaces comprise a plurality of said fluid flow regulators.

54. The wing structure of claim 43, wherein said wing structure comprises a stabilizer.

55. The wing structure of claim 43, wherein said wing structure comprises a rudder.

56. A method of improving fluid flow over a wing comprising the steps of:

obtaining a wing, said wing comprising an upper and lower surface;

featuring a fluid flow regulator in at least one of said upper and lower surfaces, said fluid flow regulator comprising:

a pressure recovery drop having a drop face of an identified, pre-determined distance;

a sub-atmospheric barrier induced at the base of said drop face as a fluid passes over said fluid flow regulator;

subjecting said wing to a fluid; and

regulating the pressure across said surface to optimize fluid flow over said wing.

57. A diffuser vane of a diffuser comprising:

a deflector surface that receives fluid flow thereon from one or more fluid flow generators;

at least one fluid flow regulator featured with said deflector surface, said fluid flow regulator comprising:

at least one fluid flow regulator featured and operable with said deflector surface, said fluid flow regulator comprising:

a leading surface;

a trailing surface;

a pressure recovery drop extending a pre-determined distance between said leading and trailing surfaces to form a down step, said pressure recovery drop comprising at least one drop face of a calculated height formed therein, said fluid flow regulator functioning to regulate existing pressure gradients along said diffuser vane to optimize and equalize said fluid flow and to reduce the separation potential of the fluid, wherein said regulation of said pressure gradients positively influences the flow properties and behavior of said fluid across said deflector vane, and the performance of said diffuser;

a sub-atmospheric barrier that is generated as said fluid encounters and flows over said pressure recovery drop, said sub-atmospheric barrier comprising a low pressure area of fluid molecules having decreased kinetic energy that serve as a cushion between said

higher kinetic energy fluid molecules in said fluid and the molecules at said surface to facilitate laminar flow and assist in the reduction of the separation potential of said fluid; and

a trailing edge that defines and extends from the base of said pressure recovery drop that provides a trailing flow boundary for said fluid.

58. The diffuser vane of claim 57, wherein said pressure recovery drop is positioned at or proximate an optimal pressure recovery point defined as the location(s) about said surface at which there is an imbalanced or unequal pressure gradient forward and aft of said fluid, thus creating an adverse pressure about said diffuser vane, which adverse pressure gradient induces friction and pressure drag that ultimately increases the separation potential of said fluid.